Space Weather Forecast

Issued on Thursday, 02 February 2023 at 13:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: No significant geomagnetic activity expected. Slight chance of Moderate solar activity throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been Low, with common-class flares. There are a total of five sunspot regions visible, with the only notable region being in the southeast. While magnetically simple, this has exhibited some slow growth. No Earth-directed coronal mass ejections have been observed on available imagery, however there are a large number of filaments on the disc which will need to be monitored for any eruption.

Solar Wind / Geomagnetic Activity: Solar wind parameters indicate a weak transient followed by the arrival of coronal hole 73. The speed rose from lightly elevated, with a small jump observed around 01/1545 UTC. The total interplanetary magnetic field strength was generally weak, but erratically increased from 01/1544 UTC to become moderate between 01/1800-2200 before easing back to weak thereafter. The north-south component followed a similar trend, with a persistent negative deflection between 01/2000 UTC to 02/2330 UTC. Geomagnetic activity was Quiet to Unsettled (Kp 0-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity is forecast with the sunspots on the visible disc currently small and relatively simple. There is a very slight chance of Moderate class flares.

Solar Wind / Geomagnetic Activity: There are no Earth-directed coronal mass ejections, although a slight glance cannot be ruled out from a coronal mass ejection later on day 2 (3rd), although this will likely miss. Current slightly elevated winds may become elevated for a time day 1 (2nd), due to ongoing effects of the high speed stream from coronal hole 73. Otherwise solar winds are expected to ease through the period, before the arrival of CH74, likely later day 3 (4th) or more likely day 4 (5th). Geomagnetic activity is expected to be mainly Quiet to Unsettled with a chance of Active intervals. There is a slight chance of G1/Minor Storms, mainly day 1 (2nd) and day 4 (5th).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to be at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	5	10	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	10	10	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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